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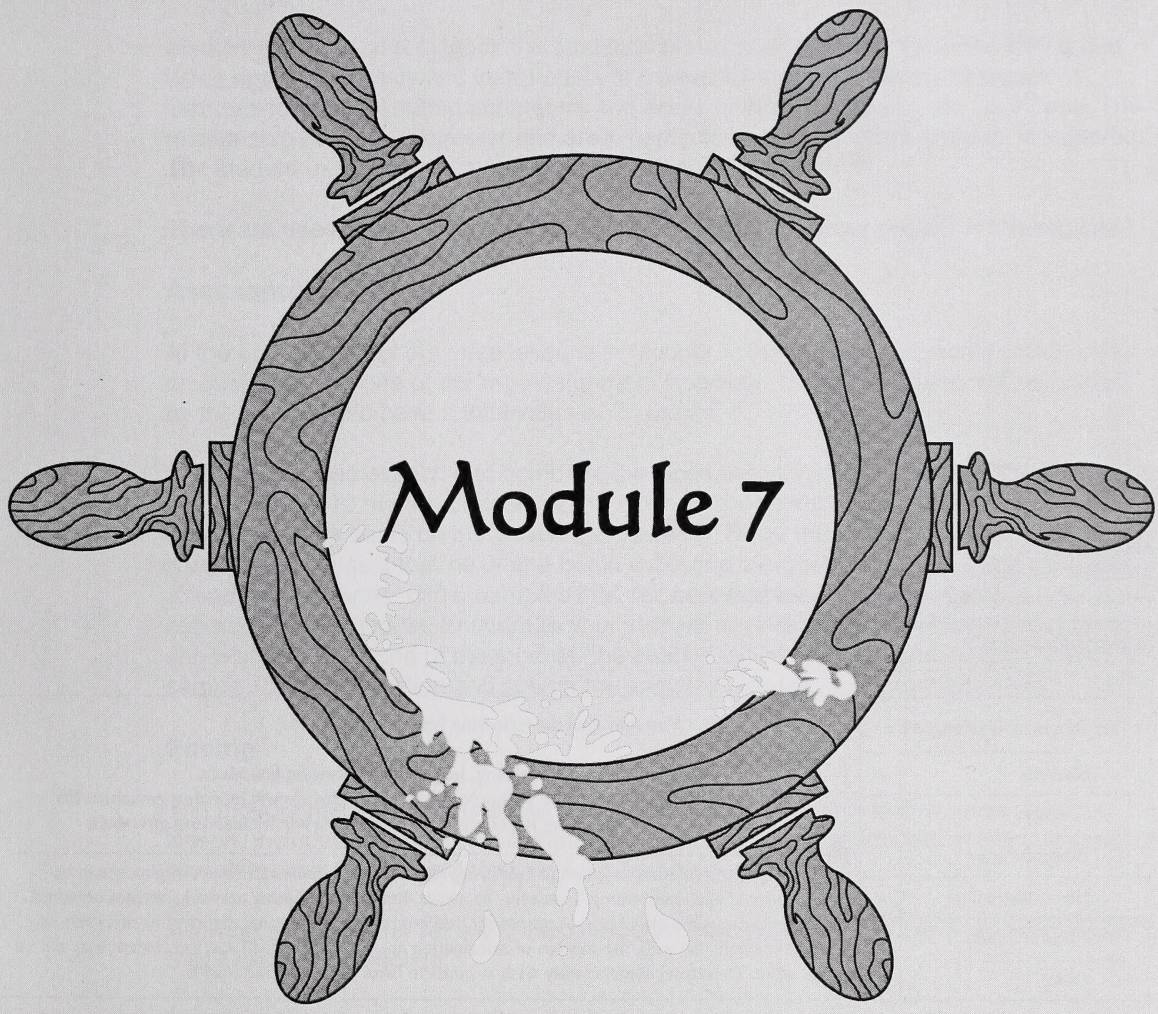
Mathematics 5



Home Instructor's Guide and Assignment Booklet 7A

Learning Technologies Branch

Alberta LEARNING

Mathematics 5
Module 7: Length and Area
Home Instructor's Guide and Assignment Booklet 7A
Learning Technologies Branch
ISBN 0-7741-2069-X

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Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
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Module 7: Length and Area

Overview

Module 7 reviews and extends the student's previous understanding of estimating and using appropriate units and instruments to measure length in a variety of situations. Methods for approximating perimeters and areas of irregular figures are developed. The relationship between perimeter and area, particularly of rectangular regions, is explored. The student uses measurement to solve problems.

There are three lesson assignments and a Number in the News project in this module.

Assessment

At the end of each of the three lessons in Module 7, the student is directed to complete an assignment in one of the two Assignment Booklets. The assignments will be graded by the teacher and have a total value of 90 marks.

Students are also expected to complete the Numbers in the News project. This project has a value of 10 marks. Encourage the student to look through a newspaper at least once a week for items on the Scavenger Hunt list. Read through the list with your student and suggest that he or she begin collecting samples of the ideas that he or she already understands. Other samples that can be collected as ideas are introduced or extended in the module. Encourage your student to collect as many samples as he or she wishes. At the end of the module, the student will need to choose at least one sample for each question and submit the samples with the Assignment Booklet.

Pacing

The module has been designed so that students can work at their own pace. Each lesson, including the lesson assignment, will take the average student about one week to complete. The Challenge Activity in each lesson is optional.

Allowing extra time for review of basic facts and project work, Module 7 will take students 3 to 4 weeks to complete.

Lesson 1: Using Linear Units

Overview

Lesson 1 reviews and extends the student's understanding of the many ways that linear units of length are used for measuring.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- string
- ruler
- metre-stick
- metal measuring tape
- cloth measuring tape
- a variety of cylindrical items

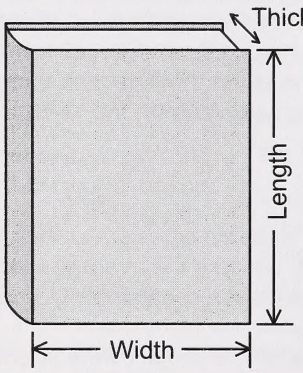
Sharing Time

There are three Sharing Time exercises in Lesson 1—at the end of Activity 1, Activity 2, and Activity 3.

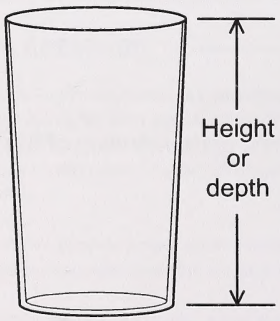
Activity 1 Sharing Time

1. Students may explain the terms orally using objects as references.

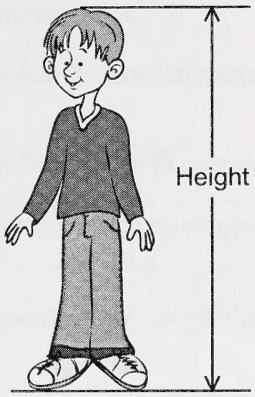
Length is usually the longest dimension of an object like a textbook.



Distance around is the perimeter.



Distance around is the circumference.



Distance around the waist is a person's girth.

2. Measuring tools like rulers and metre-sticks are used to measure length, thickness, width, height, and depth. Measuring tapes (cloth or metal) are used to measure longer distances, perimeter, and circumference.

Activity 2 Sharing Time

Practice and Homework Book, page 89

Some of the answers will vary. Sample answers are given.

What to Look For	Object Found	Actual Measurement
The circumference is 30 cm to 40 cm.	globe	38 cm
The capacity is 200 mL to 400 mL.	—	—
The length is 1 m to 2 m.	desk	153 cm or 1.53 m
The height is about 2 m.	door	213 cm or 2.13 m
The thickness is about 2 cm.	hardcover math textbook	1.9 cm
The width is about 20 cm.	hardcover math textbook	2.15 cm
The perimeter is about 50 cm.	calculator	36 cm

Activity 3 Sharing Time

The height of a telephone pole would be many times its circumference. It is tall and skinny.

The height of a pizza pan would be a fraction of its circumference. It is short and wide.

The height of a tennis ball can (containing three balls) is approximately equal to its circumference.

Lesson 2: Finding the Perimeter and Area of an Irregular Shape

Overview

Lesson 2 develops and applies methods for approximating perimeters and areas of irregular shapes.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- string
- 1-cm grid paper
- newspaper
- metre-stick
- tape
- red marker
- geoboard (optional)
- a variety of household items

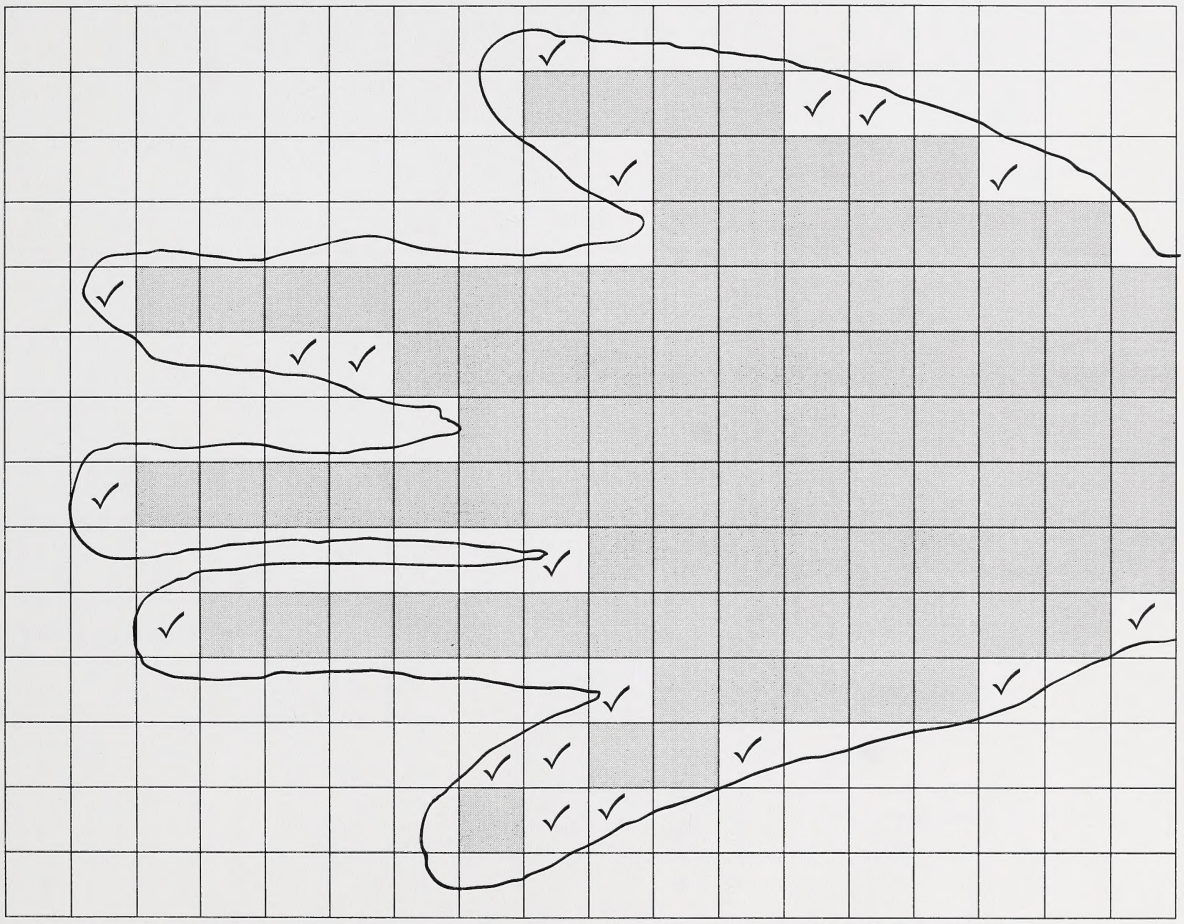
Sharing Time

There is one Sharing Time exercise in Lesson 2—at the end of Activity 2.

Activity 2 Sharing Time

Practice and Homework Book, page 93

1. Estimated Area: 100 cm^2 Estimated Perimeter: 100 cm



2. Area: 121 cm^2 Perimeter: 88 cm

3. I used string to trace the perimeter and then measured the string. I shaded the whole squares in the irregular figure and counted the shaded squares. Then I added the squares that have more than half inside the figure. $(102 + 19 = 121)$

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ASSIGNMENT BOOKLET 7A

Mathematics 5

Module 7: Lesson 1 Assignment and Lesson 2 Assignment

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Teacher's Comments

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Teacher's Signature

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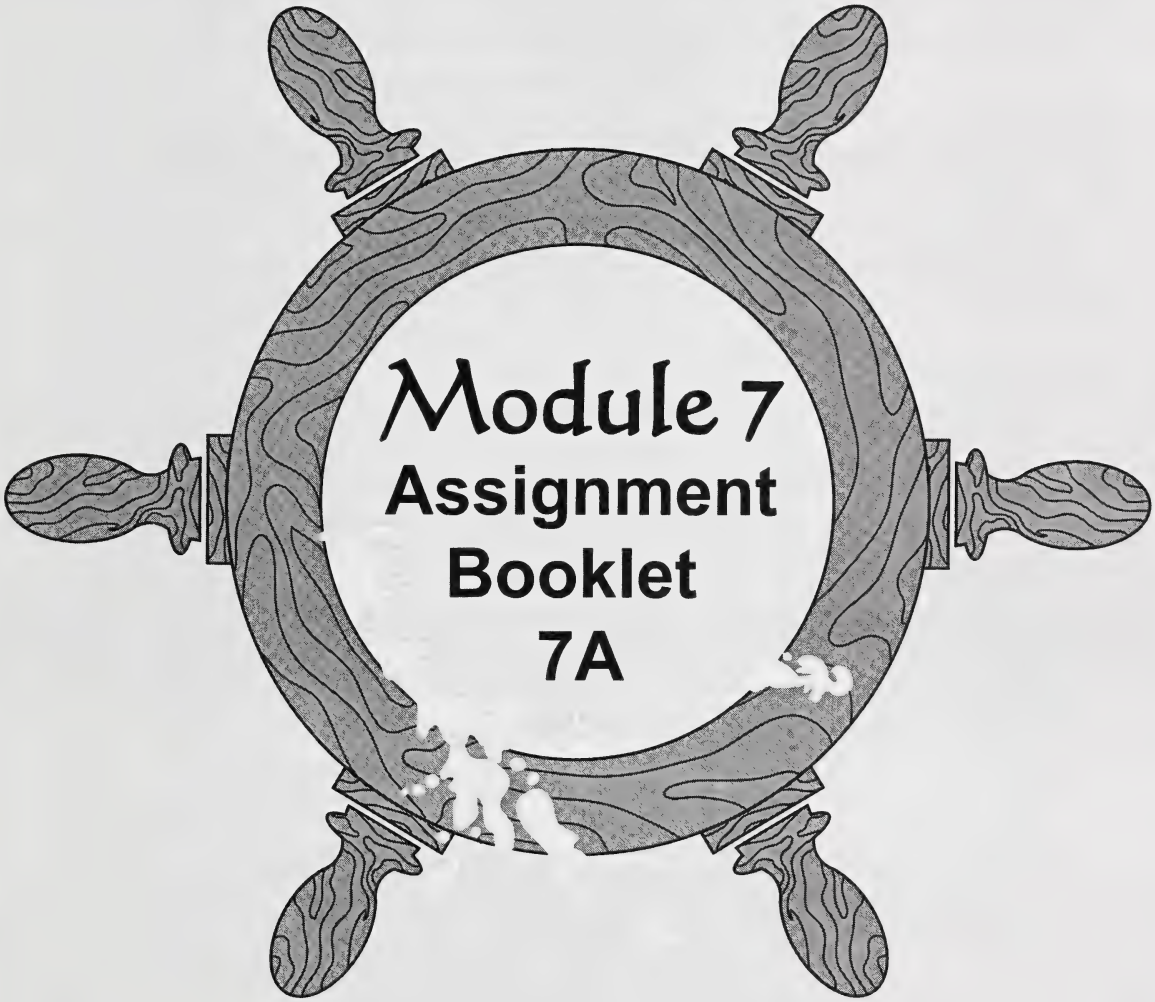

Module 7
Assignment Booklet 7A

Length and Area

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 1 Assignment	30	
Lesson 2 Assignment	26	
	56	

Teacher's Comments

Mathematics 5
Module 7: Length and Area
Assignment Booklet 7A
Lesson 1 Assignment and Lesson 2 Assignment
Learning Technologies Branch

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ASSIGNMENT BOOKLET 7A
MATHEMATICS 5—MODULE 7: LENGTH AND AREA

Your mark on this module will be determined by how well you do your assignments in the Assignment Booklets.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate lessons.

There are two lesson assignments in this Assignment Booklet. The total value of these assignments is 56 marks. The value of each assignment is stated in the left margin.

Be sure to proofread each assignment carefully.

30

Lesson 1 Assignment: Using Linear Units

1. Find a cereal box.

(3) **a.** If you need to describe the size of the box to someone else, what parts of the box would you measure?

(2) **b.** What units are appropriate and what measuring instrument would you use?

(3) **c.** Measure the parts. Sketch a picture of the cereal box you used. Identify the parts you measured and show their measures.

2. Choose a wall in your house.

(3) **a.** Measure the length of the wall to the nearest metre. _____ m

(2) **b.** When might you need to know the length of a wall to the nearest metre?

_____

_____

_____

(3) **c.** Measure the length of the wall to the nearest centimetre.

_____ cm

(2) **d.** When might you need to know the length of a wall to the nearest centimetre?

_____

_____

_____

(3) **e.** Measure the length of the wall to the nearest millimetre.

_____ mm

(3) **f.** When might you need to know the length of a wall to the nearest millimetre?

_____

_____

_____

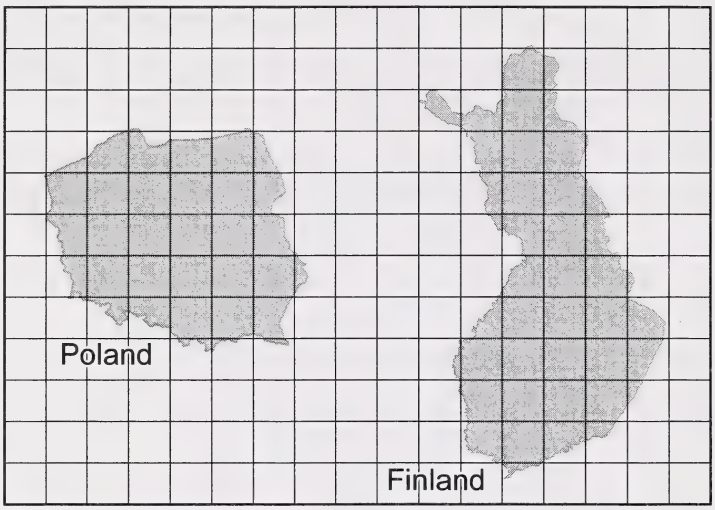
(6) **3.** Find three of the items listed in the following table. Choose appropriate units and measure their circumferences.

Item	Circumference
Compact Disc (CD)	
Lamp Pole	
Lamp Base	
Coffee Mug or Drinking Glass	
Saucer	

26

Lesson 2 Assignment: Finding the Perimeter and Area of an Irregular Shape

The following grid shows outlines of the countries of Poland and Finland. Use this grid to answer questions 1 to 5.



(3) **1. a.** Explain one way to estimate the area of each country in square units.

(3) **b.** Use your strategy to estimate the area of Poland in square units.

Approximate area of Poland: _____ square units

(3) **c.** Use your strategy to estimate the area of Finland in square units.

Approximate area of Finland: _____ square units

(3) **2. a.** Explain a strategy you can use to estimate the perimeter of each country in square units.

_____

_____

_____

_____

_____

(3) **b.** Use your strategy to estimate the area of Poland in square units.

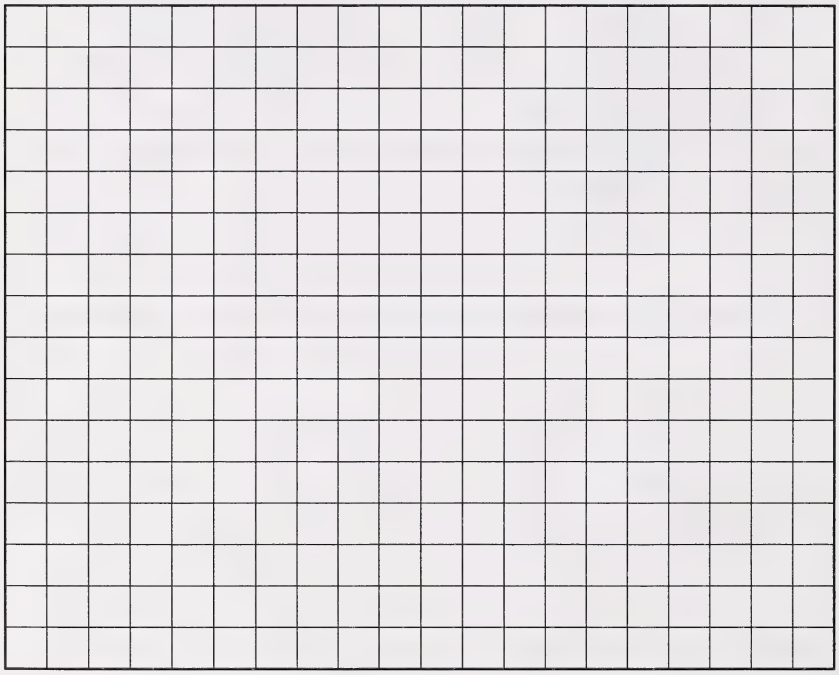
Perimeter of Poland: _____ units

(3) **c.** Use your strategy to estimate the area of Finland in square units.

Perimeter of Finland: _____ units

(3) **3. a.** Explain how you could outline a shape with more area but about the same perimeter as Finland.

(5) **b.** Outline your shape on the grid paper below.



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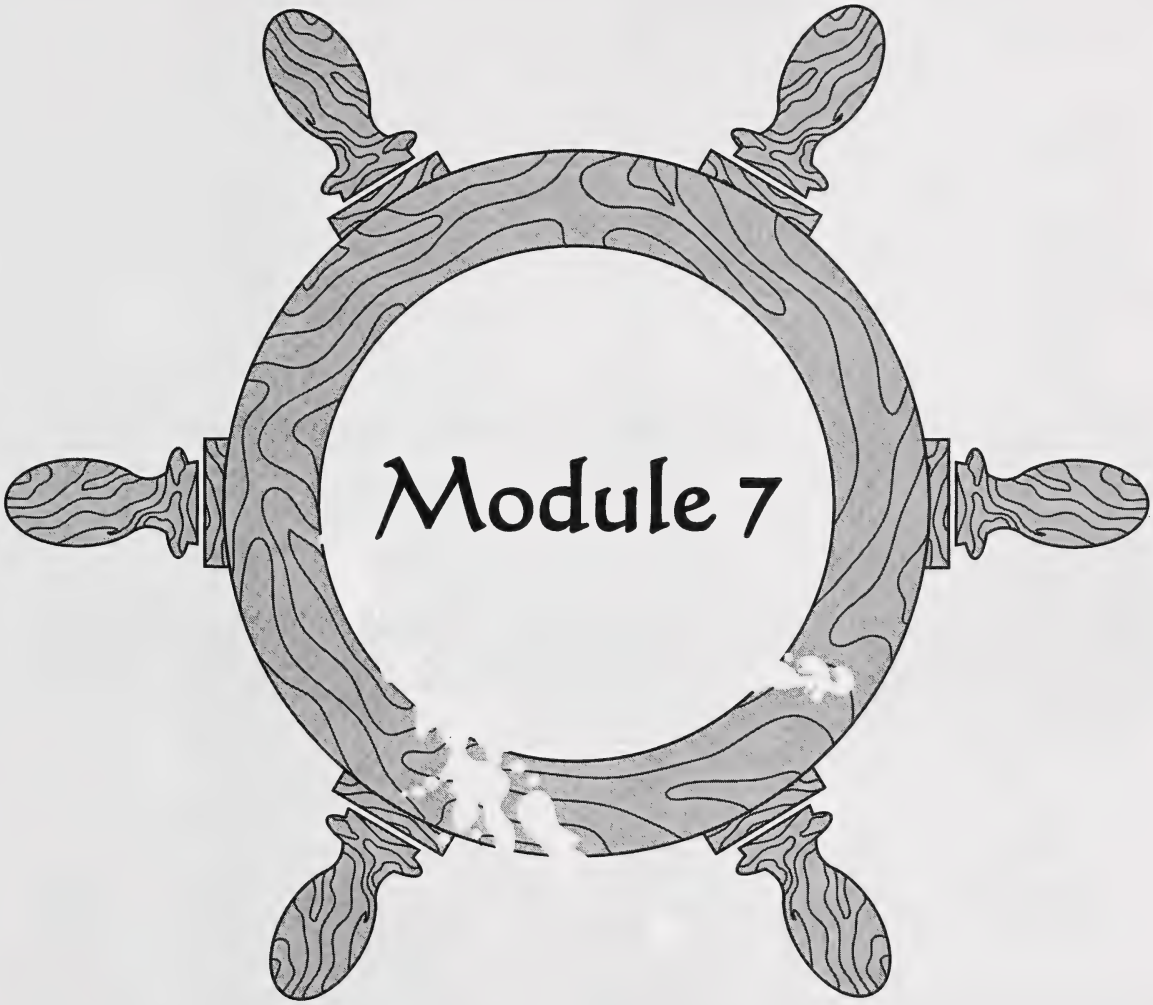
Mathematics 5



Home Instructor's Guide and Assignment Booklet 7B

Learning Technologies Branch

Alberta LEARNING

Mathematics 5
Module 7: Length and Area
Home Instructor's Guide and Assignment Booklet 7B
Learning Technologies Branch
ISBN 0-7741-2070-3

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Lesson 3: Relating Perimeter and Area

Overview

Lesson 3 explores the relationship between perimeter and area, particularly of rectangular figures. The student will apply these ideas to solve problems.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- string
- 1-cm grid paper
- small square tiles from pattern blocks

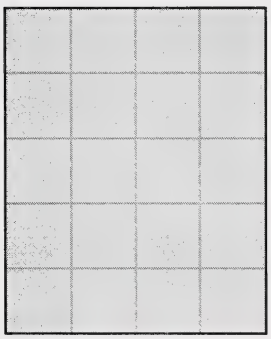
Sharing Time

There is one Sharing Time exercise in Lesson 3—at the end of Activity 3.

Activity 3 Sharing Time

Practice and Homework Book, page 95

1.

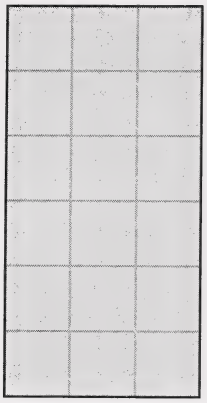


Area: 20 cm^2

Perimeter: 18 cm

Perimeter: 24 cm

2.

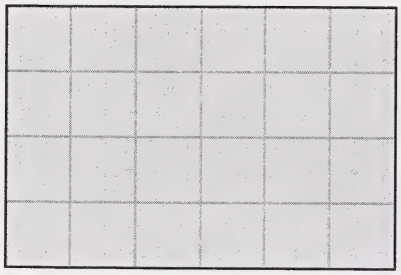


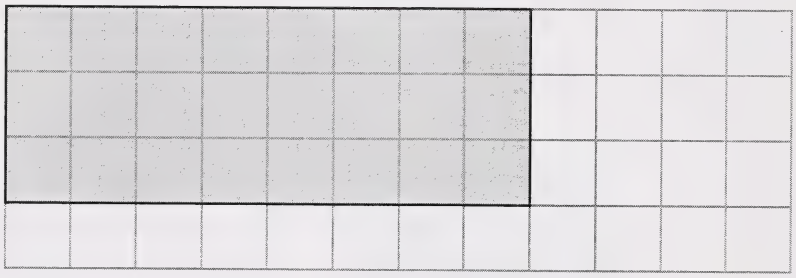
Area: 18 cm^2

Perimeter: 22 cm

Perimeter: 18 cm

3.





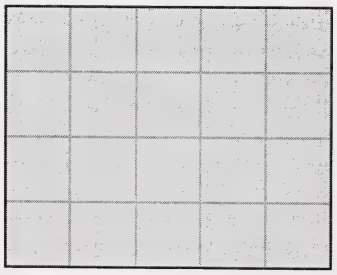
Area: 24 cm^2

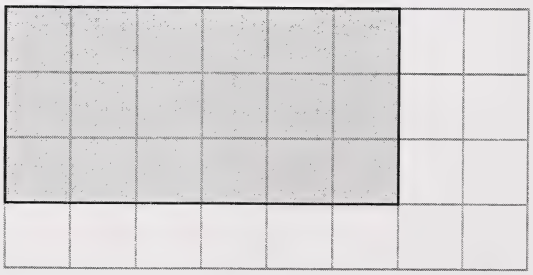
Perimeter: 22 cm

Perimeter: 20 cm

Practice and Homework Book, page 97

1.

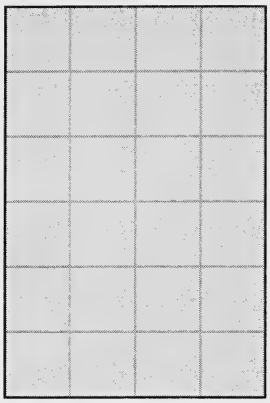




Perimeter: 18 cm

Area: 18 cm^2

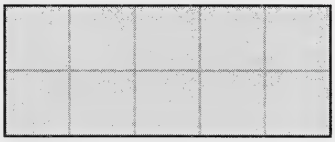
Area: 20 cm^2

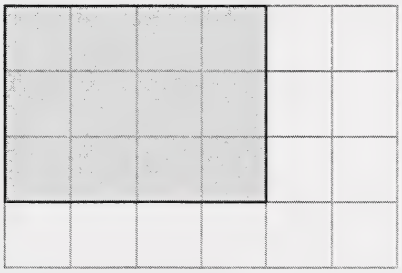
2. 

Perimeter: 20 cm

Area: 25 cm^2

Area: 24 cm^2

3. 



Perimeter: 14 cm

Area: 12 cm^2

Area: 10 cm^2

ASSIGNMENT BOOKLET 7B

Mathematics 5
Module 7: Lesson 3 Assignment and Numbers in the News

Home Instructor's and Student's Comments:

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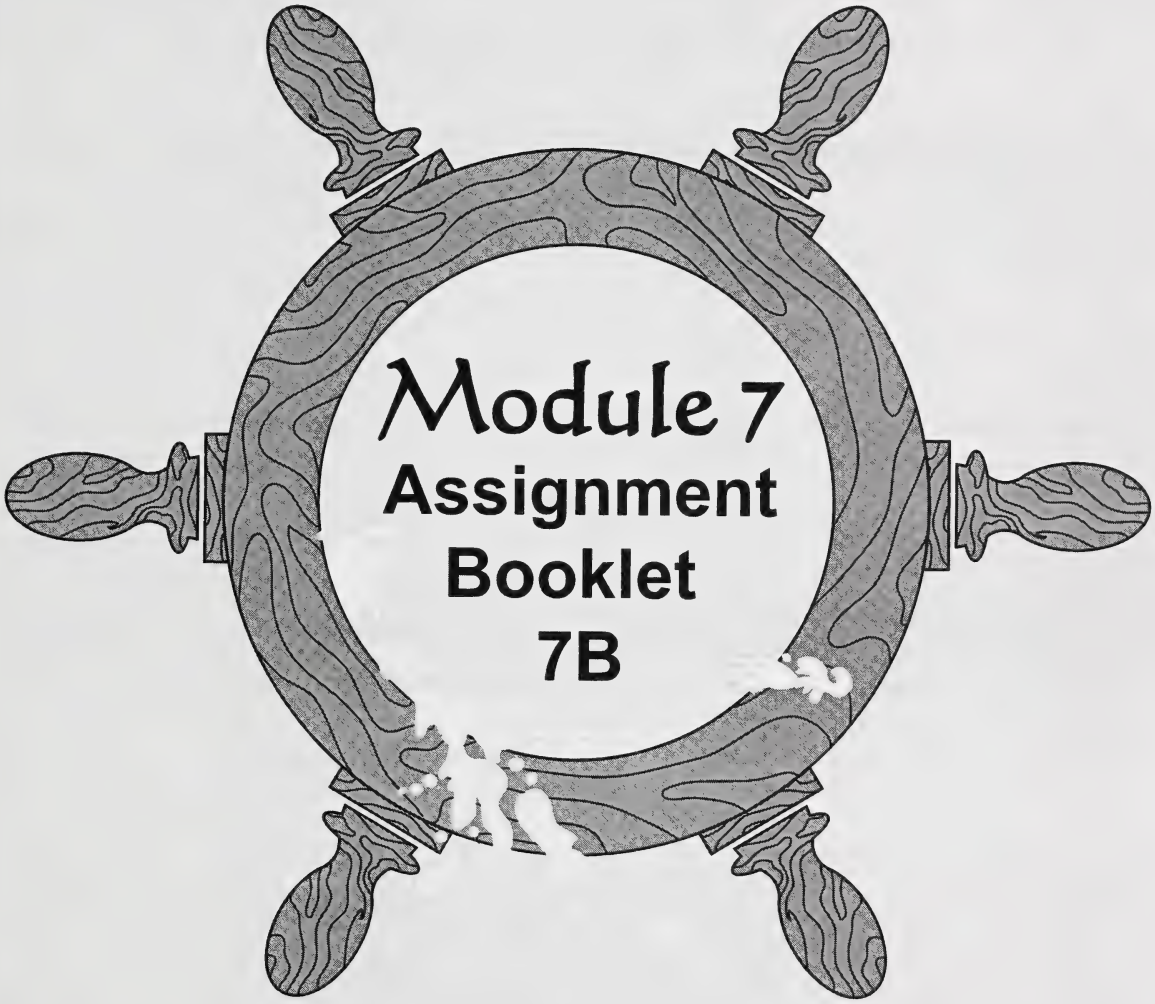

Module 7
Assignment Booklet 7B

Length and Area

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 3 Assignment	34	
Numbers in the News	10	
	44	

Teacher's Comments

Mathematics 5
Module 7: Length and Area
Assignment Booklet 7B
Lesson 3 Assignment and Numbers in the News
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ASSIGNMENT BOOKLET 7B
MATHEMATICS 5—MODULE 7: LENGTH AND AREA

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Work slowly and carefully. If you are having difficulties, go back and review the appropriate lessons.

There is one lesson assignment and a Numbers in the News project in this Assignment Booklet. The total value of the lesson assignments is 34 marks. The Numbers in the News projects is worth 10 marks. The value of each assignment is stated in the left margin.

Be sure to proofread each assignment carefully.

(34)

Lesson 3 Assignment: Relating Perimeter and Area

1. Paul used 1-cm square tiles to plan a rectangular patio before buying 1-m square patio blocks. He began with a rectangle that had a perimeter of 20 cm and an area of 21 cm^2.

(2) **a.** Explain how you can use square tiles to find the dimensions of Paul's patio.

(2) **b.** Draw a picture to show your answer.

(4) **c.** Paul decided to keep the perimeter of his model patio at 20 cm and change the area. Use tiles to find all other possible rectangles with a perimeter of 20 cm. Draw pictures that show your results.

(3) **d.** If Paul keeps the perimeter of his patio the same, describe what will happen to the area when he increases its length and when he decreases its length.

(3) **e.** If you had 20 m of decorative patio edging available, which of the possible rectangular plans would you choose to make a patio? Explain.

2. Monique had 60 patches of fabric, each measuring 2 dm by 2 dm, to make a rectangular patchwork quilt.

(6) **a.** Complete the following table to list all possible rectangles you could make with 60 square patches and the dimensions of the quilts. You may use tiles or grid paper if it helps you to find them.

Dimensions of Arrays of Squares	Dimensions of Quilt (in dm)
1 unit by 60 units	2 dm by 120 dm

(3) **b.** Which of the dimensions you listed would be reasonable for making a quilt? Explain.

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(2) **c.** Monique decided that she wanted to make a square quilt. How many of her 60 patches would she use to make the largest square possible? Explain.

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(2) **d.** What is the actual area of each of the patches Monique has? Explain.

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(2) **e.** What would be the actual area of Monique's square quilt? Show your work.

(2) **f.** Monique decided to purchase extra patches to add to the 60 patches she already had in order to make an even larger square quilt. What is the least number of additional patches she needed to purchase? Explain.

(3) **3.** If a square has the same perimeter as a different rectangle, how will their areas compare? Use words and draw pictures to explain your reasoning.

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Numbers in the News

Go through the scavenger hunt list for Module 7 to make sure you have clipped at least one sample for each question. Ask your home instructor to check the samples you found. Choose the sample you wish to use, and label each one with the scavenger hunt number it matches. Organize your samples and put them together with any other information required. Submit your project with this Assignment Booklet.

Ask yourself the following questions:

- Is my Numbers in the News project complete? (Have I included all my samples?)
- Do my samples show the ideas clearly? (Are my examples appropriate)?
- Did I take care to be neat when organizing and labelling my work?

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